

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

TECHNOLOGY DEPT.

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## GENERAL SCIENCE

# Colleges Can Handle GI'S

Statement that fewer students would be deferred next year because otherwise colleges would not have room for returning veterans is vigorously disputed.

►INDUSTRIALISTS AND educators have vigorously disputed the contention of a high Selective Service official that college draft deferments must be cut down to make room in schools for GI's returning from Korea.

They did so after Col. D. Joel Griffing, representing Maj. Gen. Lewis B. Hershey, Selective Service director, told a meeting of 500 engineers in Chicago, "There will be fewer students deferred from the draft next year."

He gave as his reason the need for making room for returning veterans of the Korean War who want to take advantage of the educational privileges of the new GI Bill of Rights.

Dr. Arthur S. Adams, president of the American Council on Education, estimating that only about 100,000 new veterans would enter college in the fall of 1953, said this would only bring college enrollment partially up to the peak year of 1947-48. He said there would be plenty of room for all of them plus the draft-deferred students. There are, at present, 207,000 college students deferred.

Col. Griffing, pointing to manpower figures, said the armed forces would soon need every physically eligible man turning 19 each year. He said about 1,200,000 men reach that age every year, but that only 60% to 70% of them are fit for service. If we are to keep up an armed force of 3,600,000, he said, all of these would have to be drafted.

Dr. M. H. Trytten, adviser to Gen. Hershey and the man responsible for the present college deferment system, said that this would be contrary to the policy set forth by Congress when it passed the present selective service legislation. He said Congress recognized the need to the nation's defense of having some serve in uniform and some serve in essential occupations.

Dr. Trytten also said that a reduction in the number deferred for college was under consideration and that, in all likelihood, this would be done before next fall. The passing mark on the college deferment examination would be raised, he said, and there would be 5,000 less students deferred for each point the passing mark is raised over the present mark of 70.

Dr. A. C. Monteith, vice-president of the Westinghouse Electric Corporation, said that any policy that would strip industry of engineers would subvert the long-range defense program of the nation as presently constituted. He pointed out that an effort is being made to keep industry going at as high a rate as possible, and that only by

doing this can the defense effort be paid for. Engineers and scientists are essential to this policy, he declared.

The statements were made at a meeting of the Engineering Manpower Commission of the Engineers Joint Council. The commission recommended that more attention be paid to building the nation's productive potential as being of far more importance for the defense of the nation than the build-up of military forces in time of partial mobilization. Advisory service to local and state selective boards with respect to professional and specialized persons was also recommended.

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## RADIO ASTRONOMY

## Radio Telescope Scans Space at 250 Megacycles

See Front Cover

►THE RADIO telescope shown on the cover of this week's SCIENCE NEWS LETTER was used in a just-completed first survey of radio waves coming from space at a frequency of 250 megacycles. Not only was the flat-disk-like form of the Milky Way galaxy recorded, but structures interpreted as its spiral arms were found, Dr. John D. Kraus, director of the radio observatory at Ohio State University, reports.

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## ASTRONOMY

## Over 400 Astronomers See Vatican Observatory

►VATICAN OBSERVATORY, one of the best-equipped astronomical institutions in Europe, was recently visited by over 400 astronomers from all over the world.

They were members of the International Astronomical Union meeting in Rome, and journeyed to the Pope's summer residence, Castel Gandolfo, where the observatory is located. Of particular interest were the spectroscopic laboratories, with equipment of advanced and modern design.

New director of the observatory is Father Daniel J. O'Connell, who for many years has been director of Riverview Observatory in Sydney, Australia. Father O'Connell, whose astronomical education is international, spent a year once at Harvard College Observatory specializing in variable star research. Thus he was particularly glad to welcome Dr. Harlow Shapley, director of

Harvard College Observatory, and others from Harvard to his new observatory.

Highly important atlases of the spectra of the chemical elements have been produced at the Vatican Observatory. With the addition of much valuable equipment within recent years, and a Schmidt telescope in the making, significant research will undoubtedly continue to come from the Vatican Observatory.

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## MARINE BIOLOGY

## Porpoises May Have Their Own Sonar Device

►WHALES AND porpoises may have used sonar, location of objects by submarine sound echoes, long before it was developed by man for war use.

Drs. W. N. Kellogg and Robert Kohler of the Florida State University's Oceanographic Institute, Tallahassee, report in *Science* (Sept. 5) that they have tested the hearing of porpoises, and find that the animals can hear sounds approximately 30,000 cycles per second beyond the range of human ears. They may also produce ultrasonic vibrations that allow them to navigate at night and in murky waters, as they are known to do, by bouncing ultrasonic echoes off obstructions.

Bats are known to use extremely high pitched sounds that they emit to locate by echoes objects that might interfere with their flight.

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## DENTISTRY

## Gum Disease Curable, Preventing Loss of Teeth

►DISEASES OF the gums can be cured, Dr. Samuel Charles Miller of New York University College of Dentistry reported at the meeting of the American Dental Association in St. Louis.

Loose teeth can in most cases be tightened, "pus pockets" can be eliminated, gums can be restored to normal, firm pinkness, and chewing can be made comfortable again.

This should be good news, especially for about half the men and boys in the country. One out of every two by the time he is 45 years old will, at the present rate, have lost all his teeth because of gum diseases or will be suffering from such disease, according to figures reported by Dr. Charles M. Belting of the VA Regional Office, Chicago, and Drs. Maury Massler and Isaac Schour of the University of Illinois College of Dentistry, Chicago.

For those who will need false teeth, cold cured acrylic resins make artificial dentures that are stronger, better wearing and which look well in the mouth, Drs. E. Byron Kelly and Ralph E. Libberton of Chicago and Dr. Victor N. Jaffe of Washington reported.

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## ASTRONOMY

# Spectral Lines Measured

Research helping to reveal composition of steel, stars and stockings reported to astronomers in Rome. Relative brightness of 30,000 spectral lines measured.

► THE COMPLETION of a research that will help reveal the composition of steel, stars and stockings, and will be of wide interest and high importance to the industrial manufacturer as well as to the academic astrophysicist, was reported by Dr. William F. Meggers, chairman of the International Commission on Standard Wave Lengths, at a meeting of the International Astronomical Union in Rome.

The relative brightness of 30,000 spectral lines in the spectra of 70 different chemical elements has been measured in the course of this work, in progress for 15 years. Dr. Meggers, in charge of the spectroscopic laboratories of the National Bureau of Standards in Washington, is one of the leading spectroscopists of the world.

In many industrial processes, it is important to know what impurities are present in a critical material and in what amounts. The impurities are frequently so minute that they cannot be detected or measured by ordinary chemical methods.

The spectroscope and the arc, however, are exceedingly sensitive. The slightest trace of an impurity is revealed by the appearance of characteristic lines in the spectrum, if the electrodes for the arc are made in part of the material under examination.

The spectrum differs conspicuously from element to element, because of the varied organization of the electrons in the outer part of the atoms. For example, sodium has one, chlorine, seven, etc.

With the aid of the new tables (soon to be published) of the intensities of spectrum lines, the composition of materials as well as the traces of impurities can be determined and the relative amounts accurately measured.

## Astrophysicist Also Aided

The astrophysicist analyzing the planetary atmospheres or the gaseous composition of stars, nebulae and galaxies is similarly aided by the new work from the Bureau of Standards. Often spectral lines appear that have not yet been identified with any element.

Such lines in the spectrum of a star may indicate that the atomic composition is chemically unusual, or that the pressure and temperature conditions on the star's surface are peculiar. The way atoms of any element vibrate and radiate their spectrum lines depends on the pressure, temperature and abundance of those atoms.

Dr. Meggers' intensity measurements, all made by him personally on a uniform basis referred to a superposed line spectrum of copper, will also be of astrophysical use in

determining for many spectra certain fundamental atomic constants known as "f values," and through them in contributing directly to basic theories of atomic structure. Heretofore, such values have been determined laboriously by other methods and for only a limited number of spectra.

The textile, chemical, metallurgical and pharmaceutical industries will be most benefited by the completion of the new tables of line intensities. In all such establishments, the spectroscope and spectrograph are important analytical tools.

The provision of standards of weights, lengths and material qualities for industry is one of the functions of the National Bureau of Standards and much basic research is a necessary part of the work.

The 70 elements studied by Dr. Meggers are all of those that show spectrum lines in

the direct current arc that are suitable for intensity (brightness) measurement. The 28 elements omitted from the tabulation include the six new, artificially-created radioactive elements, like plutonium, that have atomic numbers greater than 92, the number for uranium.

Also omitted are the five halogens (chlorine, iodine, etc.), the six noble gases (neon, argon, etc.), and oxygen and nitrogen. But all the common metals, the alkalis and alkaline earths are in the list.

For some of the elements missing from the tables, the spectral lines do not occur in the interval of wavelength from 2,000 Angstroms to 9,000 Angstroms, where Dr. Meggers has worked and where industrial scientists and astrophysicists do most of their investigations. Less than half of the measured 30,000 lines fall in the visual range from violet to red.

The number of measurable lines varies greatly from element to element. Scarcely a dozen lines can be listed for elements of simple electronic structure like sodium and potassium. The "rare earths" elements, such as lanthanum and cerium, have each more than a thousand lines in the tables. Also iron, nickel and manganese are rich in measurable lines, and the now famous radioactive uranium has many thousands of



**RIPPLE TANK**—Oceanographer Wilbur Marks indicates the wave pattern created by a typical obstruction in the ripple tank, an instrument designed and constructed at New York University for the study of ocean surface waves. The effect of wave patterns on beach erosion is being investigated by the newly-formed department of meteorology and oceanography.

lines, a most confusing spectrum, from which Dr. Meggers has made selections of appropriately distributed wavelengths.

The element copper has played a guiding role, a sort of motherly function, in all of this spectroscopic work at the Bureau of Standards. Copper is used as a reference standard for all the other 69 elements. Its spectrum is reasonably "clean" (that is, free from blends), and not too rich. The lines are nicely spread, from the shortest to the longest wavelengths. Also, copper works up easily into the electrodes for the direct-current arc.

In practice, the 69 elements are one at a time introduced as impurities into the otherwise pure copper electrodes. The amount of the impurification is accurately controlled—one atom to a thousand atoms of copper. This one-tenth of one percent is ample to give properly the combined spectrum of the "impurity" and of copper, and lead to the compilation of the 30,000 lines for the 70 kinds of atoms. The copper itself was standardized against silver of the purest quality possible.

Cooperating with the spectrographic work at the Bureau of Standards, and extremely important for the success of the enterprise, have been the chemical laboratories at the Bureau and at industrial and educational institutions. Some of the elements have been extremely difficult to get in suitable purity.

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#### ASTRONOMY

### Helium Burned to Carbon For Older Stars' Energy

►HELIUM IS being "burned" by transmutation into carbon in the extremely hot cores of some of the older stars in the universe to keep them stoked.

This possibility is substantiated by recent and still incomplete spectroscopic observations reported to the International Astronomical Union meeting in Rome by two Americans, Dr. Jesse L. Greenstein of California Institute of Technology, Pasadena, and Dr. Martin Schwarzschild of Princeton University Observatory. The temperatures rise by contraction to some 200,000,000 degrees in the center of these stars shining on helium energy.

More certain is transmutation of hydrogen into helium with release of energy in the cores of most normal stars.

The first definite hints regarding the conditions under which the stars were formed, from the very beginning of our Milky Way galaxy until now, are given by other studies of the light spectra from the stars. When the older stars, like the red giants Betelgeuse and Antares, were formed there seems to have been a lack of interstellar dust, which contains heavier chemical elements. Younger stars, like our sun, Vega and Sirius, have a relatively high abundance of heavy elements, and dust evidently was important in their formation.

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#### PHYSICS

## Problems of Space Travel

Meteors, air-friction heat and weightlessness among the many perplexing problems that must be solved before travel in space will be possible.

►SCIENTISTS WILL have to find answers to many perplexing questions before you can jump into a sleek rocket ship with a round-trip ticket to the moon.

Heinz Haber, associate physicist at the University of California, Los Angeles, told the American Society of Mechanical Engineers meeting at the Centennial of Engineering in Chicago that space travel poses numerous physical and psychological problems requiring more study.

Moderately large meteors could puncture the hull of a high-flying ship easily, he said. That could result in an immediate "explosive decompression of the crew."

Present-day airplanes are not troubled by meteors, because most of the particles from space vaporize at great altitudes as they whiz into the earth's atmosphere, wasting away completely by the time they have fallen to a 60-mile altitude. But at 90 miles, a rocket ship would run the same risk of being meteor-struck as when it is in interplanetary space, except for the protection offered by the earth, he said.

The heat generated by air friction, by the sun and by the men inside the ship creates another problem. If the rocket ship's cooling system failed, the inside heat would rise rapidly. Men would collapse in an hour at a temperature of 185 degrees Fahrenheit. It would take only three minutes if the temperature swiftly rose to 500 degrees.

Mr. Haber said cosmic rays would be a health hazard at 13 to 23 miles. Estimates show a cosmic ray concentration great enough to be considered harmful to body tissues.

A blanket of ozone surrounding the earth between nine and 25 miles high normally protects earthmen from excessive quantities of ultraviolet light. When the rocket ship passed that blanket, ultraviolet rays would become harmful to skin and eyes unless protective measures were taken.

The ozone itself could be toxic if too much of it got into the cabin air. But just as special window materials can screen out ultraviolet light, so special filters can keep ozone from entering the rocket ship.

Weightlessness would occur when the rocket ship reached an altitude of 50 or 60 miles. Experiments have shown, however, that weightlessness merely creates slight disturbances in circulation and breathing. Its most pronounced effect would be felt when passengers started to walk around, to pick up things or to coordinate body movements with their sense of touch.

Mr. Haber said little definite knowledge exists of the psycho-physical consequences

of weightlessness. He said this offers one of the biggest challenges in space-medical research.

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## AERONAUTICS

**Belly Landing Makes Runways Obsolete**

►A REVOLUTIONARY method of catapulting and belly-landing aircraft to make obsolete both expensive concrete runways and landing gear was revealed to the British Association for the Advancement of Science meeting in Belfast by Sir Ben Lockspeiser, secretary of Britain's Department of Scientific and Industrial Research.

Many landings of a Vampire jet fighter have been made successfully by the new method developed at the Royal Aircraft Establishment. Launching is by catapult as with carrier-based planes. The belly-landing is made on a tautly suspended flexible sheet, after the plane is snatched from the air by a hook as it flies a few feet above the ground. It lands without bounce on its structurally reinforced fuselage. Placing on the ground the means of absorbing the energy of landing is a new idea.

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**CATAPULT TAKE-OFF**—A navy jet fighter taking off for Korea is here flung from the catapult of the USS Antietam as the catapult officer and the "talker" crouch to the flight deck to escape the blast of gases from the jet exhaust. The dropped flaps help to catch the wind.

## PHYSIOLOGY

**Snails and Tortoise Not Lazy But Muscles Slow**

►IT IS not laziness that makes the snail and tortoise shuffle and amble along at the proverbial snail's pace, but the extremely slow rate at which their muscles contract.

Showing a group of scientists at the British Association for the Advancement of Science meeting in Belfast a chart of the contraction speeds of the muscles of a number of animals, B. C. Abbott and Dr. D. R. Wilkie of London University demonstrated that the poor tortoise and snail had muscles which contracted very much slower than those of other animals, only one-sixtieth as fast as that of some.

The London University scientists added that temperature had a great influence on the speed with which tortoise muscles could contract, the speed increasing as much as three times with a 10 degree Centigrade (18 degrees Fahrenheit) rise in temperature. This was noticeable in tortoises transplanted from their native Africa to the cold climate of an English zoo. In their native habitat, the tortoise trotted along at a considerably faster pace.

Mr. Abbott and Dr. Wilkie have studied the behavior of muscles from a wide range of animals, including frogs, men, snails, dogfish, rays, tortoises and toads.

In all cases other than in man, the scientists used isolated muscles kept in nourishing and oxygen-providing baths. If also kept free of bacteria, such muscles could be used for repeated observations over a period of days.

For experiments on human muscles, the investigators found very useful subjects in amputees on whom plastic operations had exteriorized muscle tendons in skin tunnels. Such exteriorized tendons could be used to activate their experimental apparatus.

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## PHYSICS

**Football-Sized Core**

**Experimental breeder reactor creates plutonium and also generates electricity, using sodium-potassium coolant that goes through two heat-exchangers.**

►THE HEART of the Atomic Energy Commission's experimental breeder reactor at the National Reactor Testing Station near Arco, Idaho, is an atomic fuel-holding core no bigger than a regulation football.

Yet from that small core, enough neutrons are sent crashing through a blanket of natural uranium to generate electric power sufficient to supply the entire laboratory's needs. And at the same time, precious plutonium is created.

Alfonso Tammaro, manager of the AEC's Chicago operations office, told the American Society of Mechanical Engineers meeting in Chicago that the process of generating electric power from atomic fuel may eventually become competitive with present-day generating methods.

Basically, the breeder reactor works like this: A blanket of natural uranium surrounds an atomic fuel-holding core. Neutrons shot out by the core are absorbed by U-238 atoms in the blanket. That produces plutonium, an atomic fuel vital in the production of atomic weapons.

The uranium blanket is suspended around the core in a sodium-potassium alloy coolant enclosed in a cylindrical tank. A re-

flector around the tank bounces back into the reactor neutrons that otherwise would escape. A thick lead-and-concrete shield goes around the whole works.

"Unique mechanical and nuclear devices" in the core control the chain reaction inside to prevent a "reactor runaway" and to keep temperatures from becoming too high. If the temperature gets too high, the tank and fuel will melt.

The sodium-potassium coolant, at about 625 degrees Fahrenheit, carries heat off to a heat-exchanger, needed because the coolant itself is radioactive. The heat-exchanger transfers the heat to a non-radioactive sodium-potassium cooling system. That, in turn, carries it to a second heat-exchanger that transfers the heat to water. Steam is generated to turn turbogenerators and to produce 250 kilowatts of power, more than enough to supply the laboratory's needs.

The experimental breeder reactor was not built to test the feasibility of generating electric power by atomic means. But technical information gained from the Arco reactor should be useful when engineers aim at a reactor capable of generating electric power competitively, Mr. Tammaro said.

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## METEOROLOGY

# Hurricane Superstorms

Season for Atlantic's giant tropical storms is now. Advice offered concerning how to minimize damage to yourself and your possessions both before and after swirlers.

► THE HURRICANE season in the Atlantic is late summer and early fall. Swirling winds from the hot humid areas north of the equator are likely to lash out over the tropical portion of the western Atlantic, West Indies, and south and east coasts of the United States.

High temperatures and humidity team up with converging winds in the late summer and early fall to make these superstorms. The rotation of the earth causes the whirling motion.

Born in the belt of doldrums, towards which the trade winds blow from both sides, the hurricane is the western Atlantic's version of the typhoons of the western Pacific. Although the doldrums exist throughout the year, they are farthest north at this time, and so in the best position for the earth's rotation to start whirls.

The available energy to develop such storms is greatest now. This energy is in the form of the latent heat of the great abundance of water vapor discharged from the hot surface of the strongly sunned ocean.

The air in a circle anywhere from about 50 to 500 miles in diameter presses in toward the central low pressure core, swirling around in a spiral faster and faster until its centrifugal force is so strong that it moves in a circle about 10 to 30 miles in diameter, inside of which there is almost no wind.

As the whirling wind ascends, it cools and much of the vapor in it condenses, liberating latent heat. This keeps the central zone warmer and less heavy than the surroundings, and thereby maintains the low pressure, on the existence of which the continuance of the storm depends.

Because of the rotation of the earth, hurricanes swirl in different directions in the two hemispheres. In the northern hemisphere, the rotation is counter-clockwise, and in the southern hemisphere it is clockwise.

Hurricanes can take several kinds of paths, depending on the location of the pressure areas in their vicinity. A hurricane tends to follow the southern and western border of the semi-permanent Atlantic high pressure area. The hurricane thus usually moves in a parabola, though a comparatively straight line is common. Occasionally, it may loop, crossing over the same spot twice.

Tearing over the waters of the western Atlantic, the storms expend enough energy in a single day to run all the power plants in the world for several years. But this tremendous energy has never been har-

nessed. Thrown against coastal cities, it has caused great disaster. The worst American hurricane disaster claimed 6,000 lives at Galveston, Texas, in 1900.

## Hurricane Safety Rules

► SINCE HURRICANE season is here, persons living or vacationing along the Atlantic seaboard or the Gulf Coast need to know and follow hurricane safety rules. The U. S. Weather Bureau, which has been giving hurricane warning service since 1873, gives the following directions on safety measures:

1. Keep your radio on and listen for late warnings and advisories.

2. Pay no attention to rumors. Rely only on the official Weather Bureau advices and warnings.

3. Get away and stay away from low-lying beaches or other locations which may be swept by high tides or storm waves. If your only passage to high ground is over a road likely to be under water during a severe storm, then leave early. Don't run the risk of being marooned.

4. If your house is up out of the danger of high tide and is well built (securely anchored to foundation with a good roof also securely fastened), then it is probably the best place to weather out the storm.

5. Board up windows or put storm shutters in place. When you board up, use good lumber securely fastened. Makeshift boarding may do more damage than none at all. Have strong bracing for outside doors.

6. Get in extra food, especially things that can be eaten without cooking or with very little preparation. Remember that electric power may be off and you may be without refrigeration.

7. If emergency cooking facilities are necessary, be sure they are in working order.

8. Sterilize the bathtub and fill it with water, advises the Weather Bureau. Also sterilize and fill all jugs, bottles, cooking utensils and other containers. Even for some time after service has been restored it may be wise to boil drinking water, unless you are sure the supply received from the city's mains is safe. Your health department can tell you about this.

9. Have a flashlight in working condition and keep it handy.

## After the Storm

► YOU MAY escape injury during a hurricane, only to get hurt or sick later if you do not play it safe after the storm is over.

To avoid some of the post-hurricane dangers to life and health, follow these U. S. Weather Bureau rules:

1. Seek medical care at Red Cross disaster stations or hospitals for persons injured during the storm.

2. Don't touch loose or dangling wires. Report such damage to the light and power company, or nearest police officer.

3. Report broken sewer or water mains to the water department.

4. Don't empty water stored in bathtubs or other receptacles until you are sure that a safe water supply has been restored.

5. Guard against spoiled food in mechanical refrigerators if power has been off any length of time.

6. Take down shutters and save the lumber. Store in a handy place for future use.

7. Beware of broken tree limbs. Collect fallen limbs and debris around the premises and pile along curb to facilitate collection.

8. Unless you are qualified to render valuable emergency assistance, stay away from disaster areas where you may hamper first aid or rescue work.

9. Drive automobiles cautiously. Debris-filled streets are dangerous so keep your eyes on the road. Along the coast the soil may be washed away from beneath the pavement, which may collapse under the weight of vehicles.

10. Be alert to prevent fires. Lowered water pressure makes fire-fighting difficult after storms.

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## PSYCHOLOGY

## Quarrelsomeness Inherited From Parents

► WARLIKE, QUARRELSOME tendencies are inherited from the parents, not learned from them. At least, that is what happens in mice, Dr. Emil Fredericson told the meeting of the American Psychological Association in Washington.

At the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine, a fighting strain of mice has been bred, and also a strain of mice that get along peacefully together. The feuding breed will fight with each other over a morsel of food, not just when they are hungry, but also when they are well fed. The peaceful animals will gather in a group around a single bit of food. One may pull the bit away from the others in order to take a bite, but will immediately give it back again.

When young of the feuding strain are taken from their parents before they are five days old and given for adoption to parents of the peaceful strain, they nevertheless show their quarrelsome ways. Instead of teaching their adopted young peaceful ways, their foster parents learn to join in the squabble with the young over the food.

But the young of the peaceful strain, when adopted by the aggressive parents, retain their friendly ways.

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**LARGER GROWTH FASTER**—To speed the growth of young plants, water containing terramycin is poured on young sorrel, a spinach-like plant, by Dr. Louis G. Nickell, chemist of Chas. Pfizer & Co., Brooklyn, N. Y. Even though the plants are young, the size difference between plants watered with terramycin solution and untreated sprouts can be noted.

## PHYTOCHEMISTRY

## Spurt Plant Growth

➤ JUST A soupcon of the antibiotic terramycin in the water fed to corn seedlings gives them a spurt of growth.

Usually used to cure and prevent diseases, the so-called wonder drug can also stimulate plant growth, Dr. Louis G. Nickell, head of the phytochemistry laboratory of Chas. Pfizer & Co., Brooklyn, N. Y., told the American Institute of Biological Sciences meeting in Ithaca, N. Y. Antibiotics have also been used in feed for poultry and hogs to stimulate their growth. Seemingly both effects are obtained by holding down the growth of undesirable microorganisms.

Five parts of terramycin per million of water used in watering sweet corn seeds for only four days almost doubled the weight of the plants above ground at four weeks.

Tests with sorrel, a member of the buckwheat family that closely resembles spinach, showed that when terramycin treatment is stopped completely at an early stage, growth gains continue. Dr. Nickell reported that

at 46 days a flat of sorrel given the antibiotic averaged 3.8 inches higher than the untreated plants of the same age, and had more leaves.

Experiments on radish seeds with penicillin showed that when the antibiotic was mixed in the soil at a rate of 10 units of penicillin per gram of soil, the radishes averaged from almost twice to almost three times as large as the untreated radishes.

He also reported growth stimulation of pansies with terramycin.

Stimulation of plant tissue culture with antibiotics, Dr. Nickell said, sheds new light on the mechanism of antibiotic growth stimulation in animals. Scientists do not know why antibiotics stimulate animal growth, but some of the most popular theories hold that the bacterial population of the animal's intestine is altered by the antibiotic in some way.

After more experiments, such use of antibiotics may aid practical farming.

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## GENETICS

## New Rabbit Breed Walks Like Dachshund

➤ A RABBIT that moves in an undulating walk or run like that of a Dachshund dog instead of hopping like a normal rabbit has developed by mutation from a strain of New Zealand White rabbits in California, Drs. P. B. Sawin and D. D. Crary of Jackson Laboratory, Bar Harbor, Maine, reported at the American Institute of Biological Sciences in Ithaca, N. Y.

The recessive hereditary character of this Dachs-rabbit is the result of abnormal cartilage development. The upper limbs are short, the hip and shoulder joints poorly developed, and in some cases the skull is deformed.

The Dachs-rabbit is normal at birth, becoming deformed as it develops. It can be identified by a long finger-like piece of cartilage at the base of the ear.

Science News Letter, September 20, 1952

## PHOTOGRAMMETRY

## Lens Snaps Clearer Photos High in the Air

➤ A NEW wide-angle lens for aerial cameras that gives much clearer, sharper pictures from thousands of feet in the air was described to the International Society of Photogrammetry meeting in Washington. The lens was shown for the first time in this country at the map-makers' meeting.

"The outstanding feature of this new lens is that even the extreme corners of pictures get the light necessary for good definition," Albert Schmidheini of the Henry Wild Company, Herrbrugg, Switzerland, told SCIENCE SERVICE. In the other wide-angle types so far built, he explained, the light falls off towards the corners. Definition is not so good and accurate spotting of details more difficult.

The new lens unit contains ten separate pieces of accurately ground glass, some curved inward, some outward in shape; other wide-angle lenses contain only five such separate pieces. The "completely different" system was developed by Dr. Ludwig Bertele of the Swiss concern.

Science News Letter, September 20, 1952

## PUBLIC HEALTH

## September Now Is Healthiest Month

➤ SEPTEMBER CAN claim the title of healthiest month of the year, having the smallest death toll of any month, the Life Insurance Institute, New York, finds.

U. S. mortality statistics for the country as a whole and the calendar distribution of life insurance death claims both show this.

A century ago, September was one of the worst months of the year with a death toll nearly twice that of winter months and one of the two highest monthly mortality rates.

Science News Letter, September 20, 1952

## GERONTOLOGY

**Build Up Liver to Check Old Age Diseases**

►MANY AN old person needs to have his liver built up, it appears from studies reported at the meeting of the Gerontological Society in Washington.

And there is a new drug, methischol, for doing this, Drs. Julius Pomeranze, J. I. Migden and B. Dubovsky of New York reported.

Methischol contains choline, which prevents fat deposits in the liver; inositol, which is one of the B vitamins; methionine, which is an amino acid needed to make protein, and vitamin B<sub>12</sub>.

Fatty degeneration of the arteries, a serious form of what the layman calls hardening of the arteries, might even be checked by this drug. A daily dose of three of its chemicals, choline, inositol and methionine, tended to bring back to normal the ratio of large fat particles to total fatty particles in the blood, Dr. Thaddeus D. Labecki of the Mississippi Board of Health, Jackson, Miss., reported. Disturbance in this ratio is believed a factor in causing this kind of artery hardening.

The liver, Dr. Pomeranze pointed out, has a central position in the body's chemical activities, including those related to gland function and nutrition and the utilization of foodstuffs. When the liver grows old, along with the rest of the body, some of these processes may be affected. So-called degenerative diseases of aging, such as artery hardening, then result.

Tests on aged patients, Dr. Pomeranze reported, showed that 60% had abnormal liver function. When they were given the new drug, liver function returned to normal in some and showed less abnormality in others.

Science News Letter, September 20, 1952

## AERONAUTICS

**Extremely Powerful Jet Engine Developed**

►THE TEN-YEAR age of jet propulsion for airplanes has passed another milestone with the development of a new turbojet engine, a single one of which is two and one-half times as powerful as the combined four reciprocating engines on the famous B-29 Superfortress. To develop this thrust of approximately 25,000 horsepower it utilizes an afterburner.

This powerful turbojet, developed by Westinghouse Electric Corporation, is a vastly improved version of the J-40 built by the same company and revealed about a year ago. The new engine is almost 25 feet long and 40 inches in diameter, and is an axial-flow, or straight-through, design which has become the standard in the industry. It is claimed to be the most powerful jet engine in the world.

What England claimed two months ago to be the most powerful turbojet in the

world is its new Olympus, said to have a thrust equivalent to 17,000 horsepower when traveling at speeds of 600 miles an hour. It is what is called a "two-spool" type, with a low-pressure compressor and a high-pressure unit in series. The low-pressure unit acts as a supercharger for the high-pressure compressor.

An important feature of the new Westinghouse engine is that it supplies constant speed drive for airplane accessories as an integral part of the engine itself. It is claimed to be the first turbojet so built.

This will permit designers to make substantial savings in weight and space in new planes, both vital factors in maintaining aircraft superiority. The engine itself provides important weight saving. It weighs 3,500 pounds, less than one of the engines now used in the B-29 Superfortress.

Science News Letter, September 20, 1952

## PHYSICS

**Industries Powered By Atom in Five Years**

►BUSINESSMEN HAVE been warned not to let the atomic age catch them napping.

P. J. Lovewell of the Stanford Research Institute, Stanford, Calif., said that manufacturers, processors and power utilities will be among the first to be attracted by atomic energy's peacetime uses.

Atomic industrial processes may be introduced on a modest scale within five years, he said. In 10 to 20 years, the effect in the business world should be generally felt.

Businessmen should stay abreast of the latest industrial atomic energy developments so that their processes will not become outdated, placing them in "an untenable competitive situation," he warned.

Mr. Lovewell was one of 10 speakers to discuss the industrial applications of atomic energy in a symposium held in connection with the Seventh National Chemical Exposition staged by the American Chemical Society in Chicago.

Science News Letter, September 20, 1952

## GERONTOLOGY

**Sex Still Interesting To Oldsters Over 70**

►INTEREST IN sex does not die even in old people, the Gerontological Society learned in Washington.

Reporting on a study of 200 old people averaging 74 year old, Drs. E. W. Busse, R. H. Barnes and A. J. Silverman of the University of Colorado Medical Center, told the meeting that sex frustration is an important cause of anxiety, especially in elderly women.

Although old people do not go to church as regularly as they did when younger, they still cling to their belief in God. They do not have as strong a need to atone for guilt, because as they grow old they do not do so many things they regard as wicked.

Science News Letter, September 20, 1952

**IN SCIENCE**

## GERONTOLOGY

**Metrazol Helps Aged With Arteriosclerosis**

►THE WANDERING minds of old people with arteriosclerosis can be helped by treatment with metrazol, Dr. Theodore C. C. Fong of St. Elizabeths Hospital, Washington, told a joint meeting of the Gerontological Society and the American Psychological Association in that city.

Metrazol is one of the drugs used in the chemical shock treatment of the mentally ill, but in his work with old people, Dr. Fong did not give the drug in the massive doses which produce shock. Instead, he gave a small tablet by mouth four times per day. A group of 35 patients who had been mentally ill for from one year to 20 years were treated for about three months.

About half (48%) showed improvement. They became more alert and more cooperative and they had better appetite and felt better physically. The drug had no bad effect on their high blood pressure and the few distressing symptoms resulting from it, such as nausea in a few cases, were eliminated by reducing the dose.

Science News Letter, September 20, 1952

## ENGINEERING

**Dim Fluorescent Lamps By New Control System**

►A MINOR disadvantage of fluorescent lighting has been conquered. As a result, fluorescent tubes now can be used in theaters, lighting displays, television studios and other places where lights must be dimmed.

As described to the Illuminating Engineering Society meeting in Chicago by General Electric lighting engineers John H. Campbell and Harry E. Schultz, fluorescent lamp brilliance now can be controlled with a twist of a knob.

Although regular incandescent lamps can be dimmed when the voltage is reduced, fluorescent lamps dim only slightly by that method. As soon as a critical point is passed, the lamps go off completely.

Embodying an especially designed ballast, the new system keeps the starting voltage at the proper level, but controls the current flowing through the tube. That regulates the brilliance of the light.

The control system allows fluorescent lamps to be dimmed from "full force" to a point at which they barely glow. The lamps can be turned on and off at any lighting level. The engineers said fluorescent tubes keep their original color when dimmed. Regular filament lamps become reddish.

Science News Letter, September 20, 1952



# SCIENCE FIELDS

## GERONTOLOGY

### Older Pilots Pilot Airliners Safely

►PILOTING AN airplane is not just a young man's job.

Although the older airline pilot may not pass tests of hearing, vision in dim light and reaction time quite so well as the younger men, these physiological changes with age do not affect his ability to fly. A lowered score on the tests does not mean that he will fail on his flight checks. Age has no relation to accidents.

This reassurance came when Dr. Ross A. McFarland of the Harvard University School of Public Health examined about 300 airline pilots, aged from 21 to 60 years, and compared the test results with their ability to fly. He reported his findings to the Gerontological Society and the American Psychological Association joint meeting in Washington.

Science News Letter, September 20, 1952

## BIOCHEMISTRY

### Vitamin C Essential for Anti-Arthritis Cortisone

►VITAMIN C, the anti-scurvy vitamin from citrus fruits, tomatoes and strawberries among others, may be essential for adrenal gland production of its anti-arthritis hormone, cortisone.

Studies showing this are reported by Drs. C. D. Hughes, M. J. Swenson, G. K. L. Underbjerg and J. S. Hughes of Kansas State College, Manhattan, in *Science* (Sept. 5).

When guinea pigs get scurvy from lack of vitamin C, they also get very severe arthritis. Cortisone prevents this. But ACTH, pituitary gland hormone also effective in arthritis in humans, does not. ACTH acts by stimulating the adrenal gland to produce cortisone. Evidently, from the guinea pig studies, the gland cannot do this even under ACTH stimulation when it lacks vitamin C.

Science News Letter, September 20, 1952

## PSYCHOLOGY

### Leadership Jobs Best For Those Over 40

►THE JOBS in which men over 40 are most successful are positions of leadership, Dr. H. C. Lehman of Ohio University told the American Psychological Association and the Gerontological Society in Washington.

The President of the United States averaged 55 to 59 years of age prior to President Truman, Dr. Lehman said. Of the

two candidates this year, Eisenhower is slightly older than this figure, 62 this year, and Stevenson is young for the job, a mere 52. Truman was 61 when he entered office.

Leaders of industry and business average 60 to 89. College presidents average 50 to 54. Ambassadors are 60 to 64. And Supreme Court justices are from 70 to 74.

Science and other occupations which require individual creativity depend for their best work on men in their thirties. But positions of leadership, such as President, require not so much insight of the leader himself as the insight of other people about him.

Science News Letter, September 20, 1952

## GERONTOLOGY

### Old Age Will Not Kill, But Disease Will Get You

►NO MATTER how old you live to be, you will probably never die of old age. In fact, scientists question whether death from old age is possible, Drs. Raphael Ginzberg and V. Olsvary of the Mental Health Institute of Cherokee, Iowa, told the Gerontological Society meeting in Washington. Even the oldest people are finally carried off by some disease.

"The upper limit of age predetermined by our species has never been reached by a majority or even by a considerable minority of individuals," they told the meeting.

But if you want to try to see if you can be one of the few, if any, who live out your whole life span, go to the west north central states, these doctors advise. This is the area of greatest longevity in the United States.

Science News Letter, September 20, 1952

## ENGINEERING

### Research Rockets Soon May Reach 1,000 Miles

►MULTI-STAGE ROCKETS for research should roar 1,000 miles into space within the next five years, and single-stage rockets should climb to altitudes exceeding 500 miles.

Reporting to the American Society of Mechanical Engineers meeting in Chicago as part of the Centennial of Engineering, Milton W. Rosen and Richard B. Snodgrass, both of the Naval Research Laboratory, Washington, said that "sounding rockets are the ancestors of future space vehicles, but not the immediate ancestors."

The Wac Corporal, Viking and Aerobee sounding rockets used in scientific research already have carried seven tons of instruments 140 miles into the sky. German-developed V-2 rockets have lifted 20 tons of instruments to similar heights.

But the scientists said it was too early to discuss specific designs for manned satellites and space ships, because researchers have only begun to investigate the problems of keeping humans alive outside the earth's atmosphere.

Science News Letter, September 20, 1952

## AGRICULTURE

### For Better Potatoes: Cross Wild With Tame

►MORE AND better potatoes could be grown by crossing cultivated potatoes with disease-resistant wild potato plants, Dr. Frederick J. Stevenson of the U. S. Department of Agriculture declared at the American Phytopathological Society meeting in Ithaca, N. Y.

There are now 23 cultivated and about 150 known wild tuber-bearing species. Many of these wild plants are immune to various virus diseases.

Although some crossings of such wild and cultivated plants have been made, Dr. Stevenson said the future possibilities are great, and that the surface has barely been scratched so far in efforts along this line.

The wild species have been little used because nearly all are deficient in market and cooking qualities and yield, he said. Another deterrent has been the difficulty in making crosses between these and cultivated potatoes, because of differences in chromosome numbers which make some species incompatible with the common potato.

Science News Letter, September 20, 1952

## GERONTOLOGY

### Two Hours Work At Ages 70 to 80

►OLD PEOPLE between the ages of 70 and 80 are being employed for two hours daily and getting a small payment for their work in the Finsbury Borough in London.

This "most important experiment" in efforts to keep old people mentally and physically active, and therefore happy and healthy, was reported at the meeting of the British Association for the Advancement of Science in Belfast by Mrs. A. V. Hill, member of the advisory council for the National Corporation for Care of Old People.

Science News Letter, September 20, 1952

## VETERINARY MEDICINE

### Chemical Prevents Disease of Turkeys

►A CHEMICAL preventive of a disease that causes heavy loss of young turkeys was reported to the American Institute of Biological Sciences meeting in Ithaca, N. Y. The disease is hexamitiasis, and additions of small amounts of dibutyl tin compounds to turkey feed give protection.

Drs. W. C. McGuire and Neal F. Morehouse of Salsbury's Laboratories, Charles City, Iowa, found that many poultry medications, including five antibiotics, copper sulfate and whey, were ineffective. A combination of terramycin and penicillin was found effective but economically prohibitive.

Only 0.05% dibutyl tin maleate in the feed is considered a practical preventive against the disease.

Science News Letter, September 20, 1952

## INVENTION

# Exploiting Your Idea

**Self-confidence, a patent attorney, about \$300 and a practical, new idea may help you turn your inventive genius into cash. It takes about three years to get a patent.**

By ALLEN LONG

► "I HAVE an idea," the letter begins, "but I do not know how to patent or sell it. What do I do?"

Queries such as that pour into the United States Patent Office daily. Thousands of embryo inventors scattered from coast to coast want to convert their ideas into money.

Patent Office officials say hundreds of other persons probably have invented gadgets to use around the house, but have not considered having them patented. Many of those gadgets might be turned into cold cash. Even yours.

Patent procedure is complex. But with a little self-confidence, a good patent attorney, a sum of \$300 and a practical, new idea, you can overcome the complexities of the law easily. You do not need a model of your device.

Standing by to give you assistance is the National Inventors Council. The Council will evaluate your idea, so far as it relates to the needs of the armed forces or to the welfare of the nation.

Items the Council deems worthy of further governmental investigation are referred to the Department of Defense or to the appropriate agencies. But whether or not the Council refers your idea, you can call attention to your invention through the Patent Office's "Register of Patents" that circulates to many manufacturers. You also can take your invention directly to the manufacturers.

## Start Wheels Turning

But before you do that, you should start the wheels turning toward getting a patent for your device. That is true especially if your invention will be manufactured commercially. Few manufacturers will discuss your idea until you at least have filed a patent application.

The companies consider that the wise thing to do. They may be working on a gadget similar to yours. Discussing your idea may result later in a lawsuit if the company puts out a device similar to yours, and you believe they stole some of your ideas. Dates on the patent applications will help clear up the dispute.

It is difficult to say how much a patent will cost. A lot depends upon how long it takes the patent attorney to search files for similar inventions. But for the amateur whose inventions will not be too complex, \$300 is an estimated average.

Suppose you invented a dandy dandelion puller this summer to cut down back-breaking toil in your weed-infested lawn. Suppose it has pincer-like jaws operated remotely from the end of a four-foot handle. Suppose also that you want to patent and market it. This is what you do:

Chances are that someone already has invented the same thing. Even so, your device may be sufficiently different from other inventions so that you could patent it. But you need a patent attorney to find out.

If you cannot visit the Commissioner of Patents yourself, write him for a list of attorneys and agents registered to practice before the U.S. Patent Office. The list costs \$1.75.

After you have hired an attorney, you should tell him all about your idea. He will not divulge your secrets since he may be disbarred if he does.

The attorney will search through Patent Office records for similar inventions. He will compare your weed-puller with other weed-pullers. Depending upon his findings, he will advise you to file a patent application. That will cost \$30. You will plunk

out another \$30 when the patent is granted.

A free booklet available from the Commissioner of Patents, called "General Information Concerning Patents," describes the patent application. It also contains other helpful information.

The specifications-and-claims section of the application probably is the most important. It describes what you consider to be your invention.

Since the claims must be carefully worded, it would be wise to let your attorney write them. You sign the document saying you believe yourself to be the first inventor of such a weed-puller.

If the device can be illustrated, drawings should be included in the application. Unless you are skilled in mechanical drawing, you should hire a competent draftsman. But unless specifically called for, no model should be sent to the Patent Office.

Your attorney will handle the rest. It takes about three years for the average patent to go through. If by that time you have found no manufacturer for your device, you can have your patent listed in the "Register of Patents," a list of patents that are for sale.

Thomas' Register of American Manufacturers, available at many libraries and business offices, provides a convenient list of companies who make weed-pullers. Each



**SEARCHING PATENT RECORDS**—The row of men shown here are patent attorneys studying patents previously issued by the Patent Office to determine whether their clients' devices are sufficiently different to be patented.



company is a potential buyer of your idea. Thus under the heading of "Weeders," about 40 companies and their addresses are listed.

You may be unsuccessful in persuading a company to make your device. That is the "calculated risk" you take. But on the other hand, you may be successful. And that extra income should be mighty handy.

### Many Items Patentable

A search through Patent Office records reveals many items you probably would not consider patentable. An automatic hat-tipper, for instance, was awarded patent number 556,248, years ago. The device clamped inside bowler hats and rested on the wearer's head. By merely nodding at a passing lady, the wearer caused his hat to tip a salute.

A "better mousetrap" received patent number 883,611. The gadget was designed to frighten mice away rather than to kill them. Bait enticed the mouse to stick his head through a hole in the cage-like affair. A spring collar surrounded the hole. Attached to the collar was a small bell. When the mouse stuck his head through, the collar clamped around the mouse's neck. The inventor believed other mice would be scared away when the tinkling mouse returned to the nest.

One inventor received patent number 323,416 on a pair of suspenders having a long cord attached to them. The idea was that if the wearer ever got trapped in a burning building with no means of escape, he could detach the cord and lower it to the ground where a rope could be tied to it. Then he could haul up the rope and escape.

Those patents may sound frivolous, and indeed, they well may be. But perhaps they give you an idea of just what sort of thing CAN be patented.

The device you worked out to help you around the house probably is not frivolous. Chances are that many other home owners would like to have a labor-saver just like yours. And the bigger the market is for your device, the greater your chance is of turning your inventive genius into cash.

Science News Letter, September 20, 1952

### GERONTOLOGY

## Old Folks Have Broader Outlook Than Youngsters

►DO NOT PUT the old folks on the shelf because they are set in their ways. Drs. M. E. Linden and P. D. Courtney of Norristown, Pa., State Hospital, reporting to the Gerontological Society meeting in Washington, exploded the old idea that elderly people have narrowed interests.

Our custom of relegating the older person to a "back shelf" is due, in their opinion, to an overemphasis on the importance of youth and sexual fertility.

The social outlook of old people is actually broader and less self-centered than that of younger people.

Science News Letter, September 20, 1952

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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. books in print, send a remittance to cover retail price (postage will be paid in U. S.) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**AMATEUR WEATHERMAN'S ALMANAC 1952**—David M. Ludlum, Ed.—*Amateur Weathermen of America*, 72 p., illus., paper, \$1.00. Gives main features of the weather last year and instructions that will help amateur weathermen make predictions.

**BIBLIOGRAPHY AND INDEX OF GEOLOGY EXCLUSIVE OF NORTH AMERICA**—Marie Siegrist, Mary C. Grier and Marcia Lakeman—*Geological Society of America*, Vol. 16, 462 p., \$2.50. Includes references to material published during 1951 and covers South America, Europe, Asia, Africa, Australia, Iceland and islands of the eastern Atlantic and western Pacific Ocean.

**CHILD ADOPTION IN THE MODERN WORLD**—Margaret Kornitzer—*Philosophical Library*, 403 p., \$4.50. A handbook of British origin on the historical, psychological and legal aspects of adoption. Included is a section on the United States.

**DARWIN—COMPETITION AND COOPERATION**—Ashley Montagu—*Schuman*, 148 p., \$2.50. The author points out the fallacy of "dog eat dog" thought, and the false ideas that many persons hold of Darwinism.

**DESCRIPTION OF A MAGNETIC DRUM CALCULATOR**—Staff of the Computation Laboratory, Howard H. Aiken, Director—*Harvard University Press*, 318 p., illus., \$8.00. Once information (up to 4,200 quantities and 4,000 instructions) is recorded on the drum surface it will remain there until it has been intentionally altered—an advantage of magnetic drum storage. Description is of the Mark III electronic computing machine.

**DICTIONARY OF CONFORMAL REPRESENTATIONS**—H. Kober—*Dover*, 208 p., illus., \$3.95. A collection of formulas originally prepared for the British Admiralty.

**FACT BOOK ON AGING: Selected Charts and Tables on the Personal Characteristics, Income, Employment, Living Arrangements and Health of Older Persons in the Population**—Committee on Aging and Geriatrics—*Govt. Printing Office*, 62 p., illus., paper, 30 cents. While the population of the United States has doubled since 1900, the number of persons 65 and over has quadrupled.

**FAN MAIL FOR SCIENTISTS**—*National Society for Medical Research*, paper, free upon request to publisher, 208 North Wells St., Chicago 6, Ill. This leaflet contains facsimiles of some of the threatening letters received by scientists from anti-vivisectionists.

**FLASH READER: Exercise Manual for Adults**—Lee A. Moulton, Barbara C. Nielsen and Victor L. Nielsen—*Young Scientists, Inc.*, paper, \$5.00. A manual and accompanying gadget intended to help the individual working alone to increase his eye span and speed his reading.

**HANDBOOK ON V.D.**—Carroll T. Bowen—*University of Miami Press*, 66 p., \$1.25. A brief book providing the layman with accurate and up-to-date information.

**THE HAWAIIAN MONK SEAL**—Alfred M. Bailey—*Denver Museum of Natural History*, 30 p., illus., paper, 56 cents. About one of the rarest aquatic mammals which the author has observed during two different trips to the Pacific.

**HELPING PARENTS UNDERSTAND THE EXCEPTIONAL CHILD**—Child Research Clinic—*The Woods Schools*, Proceedings of the Annual Spring Conference on Education and the Exceptional Child, 42 p., paper, free upon request to publisher, Langhorne, Pa. "Exceptional" here means abnormal or subnormal.

**HOW THE INDUSTRIAL MEDICAL DEPARTMENT FUNCTIONS IN THE VISION PROGRAM**—Daniel C. Braun—*Mellon Institute*, 4 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

**HOW TO UNDERSTAND PROPAGANDA**—Alfred McClung Lee—*Rinehart*, 281 p., \$4.00. What effect propagandists have on our society and how we can free ourselves from their control and think independently.

**THE INSPECTION OF FOOD**—Horace Thornton—*Williams and Wilkins*, 223 p., illus., \$3.00. A book of British origin, includes discussion on

bacterial and parasitic diseases. For students of public health, agriculture and meat technology.

**JOHN COLTER: His Years in the Rockies**—Burton Harris—*Scribner's*, 180 p., illus., \$3.50. A native of the Colter country has attempted to trace the trail and adventures of the discoverer of Yellowstone Park and Colter's Hell.

**JUNO, SYMBOL OF ALL WOMEN**—Deac Martin—*Cleveland Health Museum*, Healthguide No. 1, 16 p., illus., paper, 25 cents. This Juno is a transparent, talking woman who has no secrets and discusses her anatomy at the Science Theater of the Cleveland Health Museum.

**LAS ENFERMEDADES INFECCIOSAS DE LOS ANIMALES DOMESTICOS**—William Arthur Hagan and Dorsey William Bruner—*La Prensa Medica Mexicana*, 2nd ed., 800 p., illus., \$11.40. One of the U. S. scientific and medical books translated into Spanish and published in Latin America under the U. S. State Department-Science Service program.

**THE MINERAL RESOURCES OF THE WORLD**—William Van Royen and Oliver Bowles—*Prenice-Hall*, Atlas of the World Resources, Vol. II, 181 p., illus., \$10.75. Maps showing the distribution of 29 minerals, all of which are important in world trade. Largest uranium deposits are in Canada and the Belgian Congo.

**THE OCEAN RIVER**—Henry Chapin and F. G. Walton Smith—*Scribner's*, 325 p., illus., \$3.50. A poetic and scientific account of the great system of currents in the North Atlantic Ocean. The authors refer to the Ocean as the greatest river in the world, whose daily flow of water is nearly one thousand times as great as the Mississippi.

**OUR AMAZING BIRDS: The Little-Known Facts About Their Private Lives**—Robert S. Lemmon—*Doubleday*, 239 p., illus., \$3.95. The dipper, about the size of the robin, walks and flies under water with the same ease as it does above. In this volume, the author attempts to give something of the "personality" of this and other birds.

**THE OUTLOOK FOR WOMEN AS PHYSICAL THERAPISTS**—*Govt. Printing Office*, Bulletin of the Women's Bureau No. 203-1, Revised, 51 p., illus., paper, 20 cents. The number of physical therapists has doubled in the last eight years, but it is estimated that it must more than double in the coming eight years.

**PLANTS OF THE BIBLE**—Harold N. Moldenke and Alma L. Moldenke—*Chronica Botanica*, 328 p., illus., \$7.50. One common error that is made by those who visit the Holy Land is to assume that all the plants seen growing existed in

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Bible days. Many are now, and others that grew then have now disappeared.

**PRINCIPLES AND METHODS OF CHEMICAL ANALYSIS**—Harold F. Walton—Prentice-Hall, 435 p., illus., \$8.65. Text intended for senior undergraduates and graduate students covering the field of non-instrumental analysis.

**SPACE AND TIME PERSPECTIVE IN NORTHERN ST. JOHNS ARCHEOLOGY, FLORIDA**—John M. Goggin—Yale University Press, Yale University Publications in Anthropology, No. 47, 147 p., illus., paper, \$2.00. The study points out a long continuity of culture in the Northern St. Johns Region, which began before the time of Christ and extended to the eighteenth century.

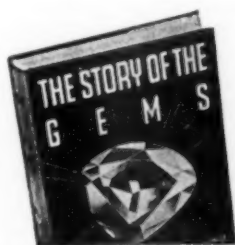
**SQUEAL OF TIRES ROUNDING CURVES**—Joseph Barnett and others—Highway Research Board, Bulletin No. 51, 16 p., illus., paper, 30 cents. When you hear tires squealing around a curve, it does not mean that the car is speeding.

**38 COMMON QUESTIONS—38 AUTHORITATIVE ANSWERS: Subject Animal Experimentation**—National Society for Medical Research, 14 p., paper, free upon request to publisher, 208 North Wells St., Chicago 6, Ill. Facts in handy form for use in combatting the propaganda of anti-vivisectionists.

**VECTOR ANALYSIS**—Earl C. Rex—William C. Brown, 88 p., illus., paper, \$3.25. An introductory text for mathematics and physics students containing 53 examples with their solutions.

Science News Letter, September 20, 1952

Maine fishermen are using a rubber suction hose to load sardines aboard boats from fish nets; the hose can load 65 tons of sardines in an hour, three times more than done formerly by pulling the net and fish aboard.



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### GENETICS

## Complete White-Negro Mixing in 1,000 Years

► COMPLETE MIXING of the white and Negro races in the United States will probably take about 1,000 to 2,000 years, or 40 to 70 generations.

The white-Negro mixture rate was discussed in Ithaca, N.Y., before the American Society of Human Genetics by Dr. Bentley Glass of the department of biology of Johns Hopkins University, Baltimore, and Dr. C. C. Li of the Graduate School of Public Health, University of Pittsburgh.

They reported that "3.6% of all the genes in the North American Negro population are freshly introduced from the North American white population per generation." Their figure is based on measuring the number of times certain genes, tiny carriers of heredity, occur in Negroes. One of the genes used was R<sup>0</sup>, a gene involved in Rh blood grouping.

According to their calculations, this gene occurs 63% of the time in West African Negroes, 44.6% of the time in North American Negroes and 2.8% in whites.

Seven different genes were studied, six of them affecting blood types and one affecting the ability to taste phenylthiocarbamide, a chemical that is unpleasant to some persons, has no taste for others. The difference is believed to be dependent upon inherited factors.

Drs. Glass and Li have found that on the basis of these gene measurements, the rate of mixing of genes between the white and Negro races can be found. They use a period of 10 generations (1675-1950) as the time during which mixing has been going on.

The average rate between 1675 and 1950 has probably not been constant, they say. It has, rather, been a curve that gets flatter as time goes by. In other words, the mixing was much greater at the beginning of their measurement period, 1675, than it is now.

Or, as they say, "Thirty percent of the genes in the U. S. Negro population are by now derived from the U. S. white population—but it will take far more than 10 additional generations for the next 30% to become transferred, unless the average rate is increased."

If the present average rate were to be kept up indefinitely, Drs. Li and Glass figure, it would take about 40 to 70 generations, or 1,000 to 2,000 years, before the Negro-white mixing is complete.

Their method not only tells what the total amount of intermixture is at the present time, but also tells about how fast the process has proceeded in the past.

Drs. Bentley and Glass also outlined a method for studying whether the rate in the three generations now living is greater, lower or identical with the average rate.

The study was based on Negro populations in Baltimore, New York and several other large cities.

Science News Letter, September 20, 1952

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## NUTRITION

# Ice Cream Substitute

Synthetic ice cream, tasting much like the real thing, now on the market in certain cities. Controversy considered to be like that over oleomargarine versus butter.

► ARE WE going to have a substitute for ice cream? Will your sundae or cone or the carton you take home for dinner have ice cream in it? Or will it be filled with what is called in trade circles a "foreign fats product?"

"Foreign fats" mean vegetable fats or oils instead of butter fat or cream.

In some quarters this new product is considered a substitute or synthetic ice cream. The situation is said by some to be like the oleomargarine-butter situation.

Not so, says the International Association of Ice Cream Manufacturers. This group looks on the new product simply as a new product. A manufacturer may make ice cream, sherbet, ices and now, or in the future, this new product. He will not call it ice cream, but will give it a "fanciful" name, such as Freezert or Partyfreeze.

The new product will taste very much like ice cream. Some say only an expert ice cream judge can taste the difference. It will sell at a lower price than ice cream. In one

large city where it is now on the market, the price is reported to be 19 cents a pint.

Nutritionally, ice cream and the new "foreign fats product" are almost the same. Both probably furnish about the same number of calories per serving and the same quantity of non-fat milk solids. Flavorings are the same. But, unlike oleomargarine, the cottonseed, soybean, peanut or whatever vegetable oils are used in the new kind of ice cream are not fortified with vitamin A.

Whether you can now buy the new "foreign fats product" instead of ice cream depends on where you live. In Texas you can get it. It is sold there under the name Mellorine. This state has already established standards for the product and any Mellorine sold there must come up to those standards and be sold as Mellorine.

In Illinois, a State Supreme Court decision now allows sale of the new "foreign fats product," and it is apparently being sold there under various names coined by the manufacturers.

In Oklahoma and Missouri, "weak laws" governing ice cream standards allow sale of the new product.

In Kansas, manufacture and sale of a soya frozen dessert was started but stopped by a restraining order and the case is now pending before that state's Supreme Court.

The U. S. Food and Drug Administration has no jurisdiction over this new product of ice cream manufacturers unless it is shipped for sale or barter across state lines. So far, Food and Drug officials have not heard of this being done.

Federal standards for ice cream itself are now in process of being established. The Food and Drug Administration is resuming hearings and testimony will be given on the use of surface active agents, that is, quaternary ammonium compounds, as emulsifiers in ice cream.

Most states have very strict laws prohibiting the use of "foreign fats" in ice cream or any product sold in semblance of ice cream.

A new kind of carton, sales in factory-filled packages only, special labels and advertising are considered by some ice cream manufacturers as necessary to prevent deception of the consumers with the new product.

The new product can be made with regular ice-cream-making equipment, except in California where a state law prohibits this. So far, all of the new product is being made by ice cream manufacturers in addition to their regular line. The one known exception is a manufacturer in St. Louis who makes this product exclusively. He had previously made another dairy product, but not ice cream.

## Questions

**AERONAUTICS**—How can runways and landing gear be made obsolete? p. 181.

• • •

**ASTRONOMY**—From what source do older stars get their energy? p. 180.

• • •

**GENETICS**—What is the rate of white-Negro mixing in the U. S.? p. 189.

• • •

**INVENTION**—What steps are recommended for patenting an idea? p. 186.

• • •

**PHYSICS**—How large is the core of the experimental breeder reactor? p. 181.

• • •

**PHYSIOLOGY**—What makes snails and tortoises move so slowly? p. 181.

• • •

**PSYCHOLOGY**—In what type of jobs are men over 40 most successful? p. 185.

• • •

Photographs: Cover, Ohio State University; p. 179, New York University; p. 181, U. S. Navy; p. 183, Chas. Pfizer & Co.; p. 186, Fremont, Davis.

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## PUBLIC HEALTH

## DDT More Dangerous, Fat Accumulation Hints

► A WARNING that the widespread use of DDT insecticide may be more dangerous than has been thought appears in a report from Drs. G. W. Pearce, A. M. Mattson and W. J. Hayes, Jr., of the U. S. Public Health Service's Communicable Disease Center, Savannah, Ga.

Tests of DDT deposits in human fat from persons who had no known excessive exposure to the insecticide showed a large proportion of a chemical believed to be a degradation product of DDT. This chemical, the scientists think, is one called DDE, short for 2,2-bis(p-chlorophenyl) 1,1-dichloroethylene.

Whether DDE gets into human fat as a result of partial degradation of DDT on food plants before eating, or whether it gets there because DDT is degraded during digestion or after deposit in human fat are still unanswered questions.

"If DDT is slowly degraded after deposition in the fat, it would seem of great importance in assessing any potential danger from food contamination with DDT," the scientists state in their report to *Science* (Sept. 5).

"In any case, the evidence for the occurrence of substantial proportions of DDE suggest that the possible health hazards involved in the widespread use of DDT need to be reconsidered and further investigated."



## CHEMISTRY

# Reversible Baldness

►GLASS MADE of paper with its fibers so closely packed that it can filter out radioactive dust in atomic energy installations, synthetic oils that keep on lubricating at both 500 degrees above and 100 degrees below Fahrenheit, a new way of stopping hair from growing, a new synthetic fabric and a way to make a runway out of sand—all these went on exhibit when the Trail Blazers section of the Seventh National Chemical Exposition opened in Chicago.

The National Bureau of Standards developed the glass paper. The job was done specifically to answer the problem found in atomic energy installations of radioactive dust particles in the air. The Bureau says the new glass paper is many times more effective than present commercial air filters.

The Office of Naval Research exhibited, for use in turboprop and turbojet engines, a new synthetic lubricant that will not boil at extremely high temperatures and will not freeze at very cold temperatures. Also shown were four new synthetic lubricants designed for four parts of a 20 millimeter

automatic aircraft cannon. With these, pilots can fire the cannon at temperatures from minus 75 to plus 150 degrees Fahrenheit.

Dr. Peter Flesch of the University of Pennsylvania's department of dermatology showed how too much vitamin A can cause reversible baldness in both animals and humans. Also human sebum leads to reversible hair loss in animals. Dr. Flesch says these findings may provide a chemical approach to common baldness.

Dynel, a synthetic fabric developed by the Carbide and Carbon Chemicals Company, will not shrink or stretch, is resistant to stains, mildew and destructive insects, sheds wrinkles, holds a press, is fire resistant, chemically resistant and can be dyed many colors.

A cheap substance from the concentrated waste of sulfite paper mills helps the Army Corps of Engineers make roads and runways by stabilizing the soil. Briquets of soil treated with this chrome-lignin method were on exhibit.

Science News Letter, September 20, 1952

time," he said, "the diesel engine has fixed maximum capacity which cannot be overloaded, and this type of locomotive cannot supply even temporarily the large demands for power for rapid acceleration as can the electric locomotive."

Continued research in electrical engineering should help keep electric power cheap. When combined with the latest developments in electric engines, this should make railroad electrification attractive again because of an overall economy, he said.

Science News Letter, September 20, 1952

## Do You Know?

The eye's pupil can decrease its area 80% in three seconds.

Cuba's 1952 record sugar crop of 8,000,000 tons is the largest ever produced in any country.

It took the white man two centuries to spread himself over as much of the United States as the European corn borer has covered in 35 years.

Azaleas, rhododendrons and pyracantha each are attacked by a different kind of lace bug, a prime pest of broad-leaved evergreens.

## GENERAL SCIENCE

# Role of Engineers

►THE ENGINEER stands about half way between the inventor and the scientist. He is interested more in the results of scientific principles than in the principles themselves.

Speaking at the Centennial of Engineering in Chicago, Dr. W. F. G. Swann, director of the Bartol Research Foundation of the Franklin Institute, Philadelphia, said the scientist, on the other hand, was more concerned with the principles of things than with their consequences.

And the inventor, he said, knows little of the principles. He is guided by an intuitive sense that tells him that certain things work when put together in a given way.

The scientist has mapped out "regions of assured fertility, dubious fertility and al-

most certain sterility," he said. Scientists and engineers explore the first two regions but the inventor works in all of the regions, occasionally finding a new device in the "sterile" region.

One inventor was so successful in producing from the sterile region that his employees hung a sign in his laboratory that said: "The poor fool didn't know enough to know that it couldn't be done, so he went ahead and did it."

Since the engineer is not particularly interested in the principles themselves, he has worked out certain empirical relationships to guide him. But those aids, Dr. Swann said, are being replaced rapidly by fundamentals, especially where electronics and atomic structure are involved.

Science News Letter, September 20, 1952

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## ENGINEERING

## Trains Pulled by Diesels Believed Temporary

►THE DIESEL engine common to today's railroads may give way to electric engines just as steam engines gave way to diesels, H. F. Brown of the Westinghouse Electric International Co. told the American Institute of Electrical Engineers meeting at the Centennial of Engineering in Chicago.

Mr. Brown said many engineers believe the diesel is an "interim" engine.

"Although its electrical equipment can withstand overloads for short intervals of

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❁ **BLADELESS ELECTRIC** fan whirls 15- and 20-inch circles of filter paper on a vertical shaft much like a phonograph turns records. Filter paper sections are spaced ¼-inch apart and produce a breeze-like effect all the way around the fan. Dirt particles stick to the filter paper as air is "sucked" through the disks.

Science News Letter, September 20, 1952

❁ **POTTER'S WHEEL** for schools, camps or the hobbyist is driven at variable speeds by an electric motor. The unit embodies other features to make it almost a complete ceramic shop, the manufacturer says. In addition, the quiet-running tool can be adapted to gem-cutting and gem-polishing.

Science News Letter, September 20, 1952

❁ **WINDSHIELD SCRAPER** for summer or winter use has a hard plastic edge for removing sleet, ice and snow, and a soft rubber squeegee edge for cleaning bugs, rain and mud from the glass. The hard edge will not scratch the glass.

Science News Letter, September 20, 1952

❁ **AQUARIUM FILTER** feeds the waste from fish to plants at the bottom of the tank, and helps oxidize plant wastes to keep water contamination at a minimum. Requiring an air hose, the plastic device, shown in the photograph, can be adapted



to single or multiple tank hookups. Illustration shows filter operating in a bed of ⅛ inch gravel.

Science News Letter, September 20, 1952

❁ **LITTER LIFT** capable of bringing two loaded stretchers aboard an airplane at once, weighs about 250 pounds and lifts patients in a level position from ground to

cabin floor. Easily set up where walk-up ramps are not provided, the device can load 40 casualties in about 20 minutes.

Science News Letter, September 20, 1952

❁ **"DENSIFIED" CLARINETS** and oboes are made by one company producing wood veneers impregnated with phenolic resins. Heated while under pressure, the densified wood resists scratching, moisture and body acids. The instruments weigh about the same as comparable instruments made of Grenadilla wood.

Science News Letter, September 20, 1952

❁ **FACE SHIELD** protects eyes and lungs of workmen where dust or small flying chips may be hazards. A transparent visor covers a large area of the face and forehead, and a throw-away cotton-and-gauze filter screens air entering the workman's nose or mouth.

Science News Letter, September 20, 1952

❁ **RUST INHIBITOR** is sprayed on from a "bomb" capable of treating about 50 square feet of surface area. The lacquer cuts corrosion of automobile chrome, copper objects, window screens, outdoor furniture and brass door knockers. Because it is sprayed on, areas otherwise difficult to hand-paint can be lacquered.

Science News Letter, September 20, 1952

# • Nature Ramblings •

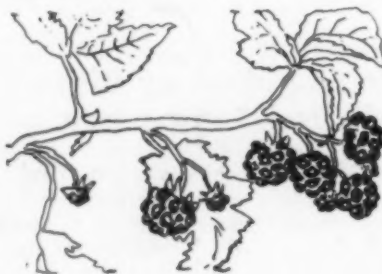
► **AUTUMN BRINGS** many bright berries and fruits along with the late brightness of its asters, gentians and cardinal flowers.

They are very attractive to look at, these coral-berries, snow-berries, black-haws, false bittersweet and all the rest. But their attractiveness is all to the eye; no human tongue, not even that of the omnivorous small boy, could find them tempting. They are either bitter, or impossibly sour, or at best insipid.

Yet birds eat them all, and seem to thrive on them. The hardy feathered sojourners from Canada, for which the snowy zone of the United States is "South for the winter," even eat the dark, gritty-looking fruits of the sumac and the pallid, gray-white berries of poison ivy.

They are probably the principal means of distribution for some of these berry-bearing species, for the birds digest the

## Berries for Birds



pulp off the seeds, letting the latter pass through their digestive tracts still in viable condition.

How the birds manage to down these

ill-tasting fruits, and even make them a major item in their winter diet, is something of a puzzle. Some zoologists claim that birds in general are "taste-blind." If they are, it must be a great help to them, considering the ill savor, not only of these berries but of many other things that birds eat.

If you are a suburban or rural dweller, it would be a good idea to include in your yard plantings some of the bright-berried bushes that birds frequent, setting them out where they can be easily seen from living-room or kitchen windows.

Then, when the ground is snow-covered and birds come around to these natural lunch counters, you will be able to reap without effort the pleasant reward their beauty will give you for the little trouble you have taken.

Science News Letter, September 20, 1952